01-24-2022

ClimateSERV: Web-based data analytics and delivery of high-value climate datasets for applications

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Countries Around the World Need Satellite Data

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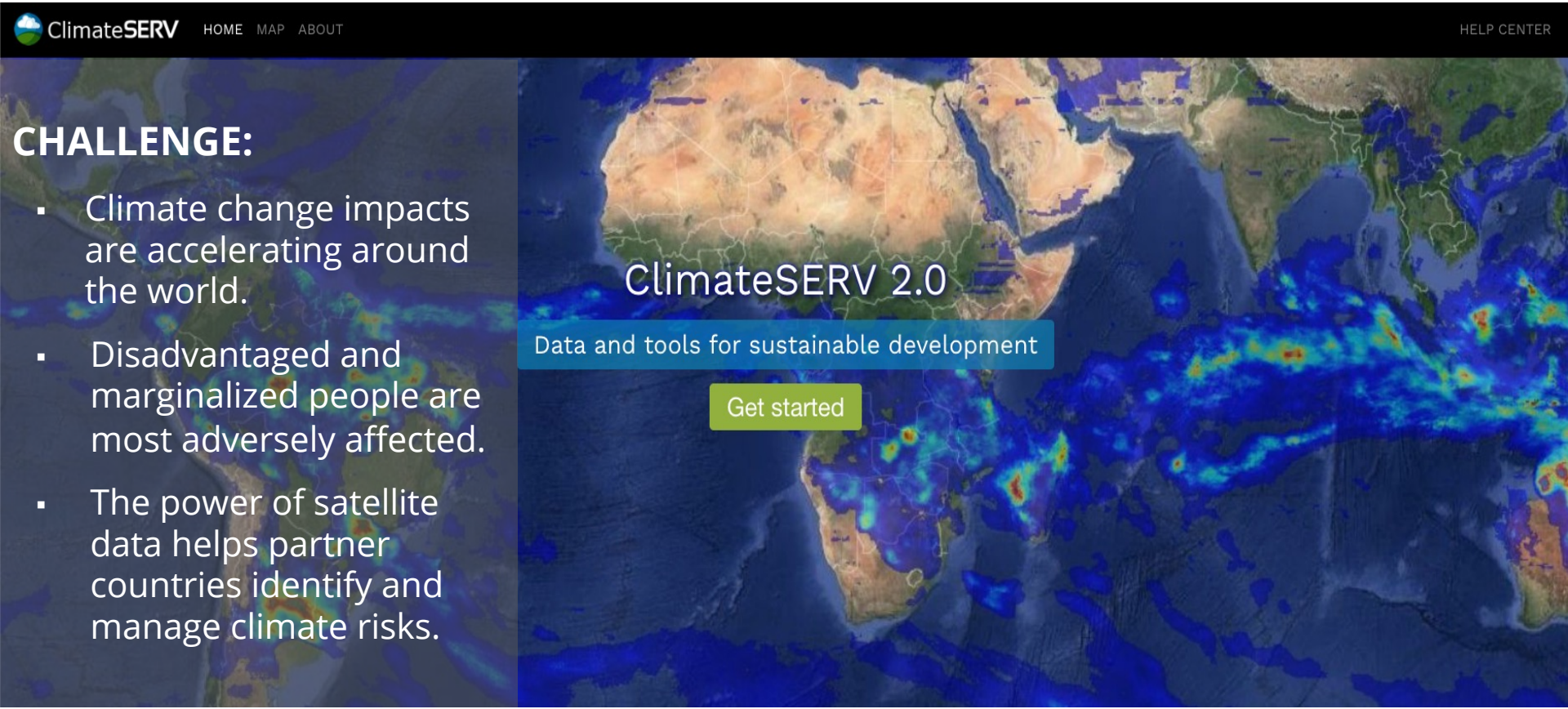
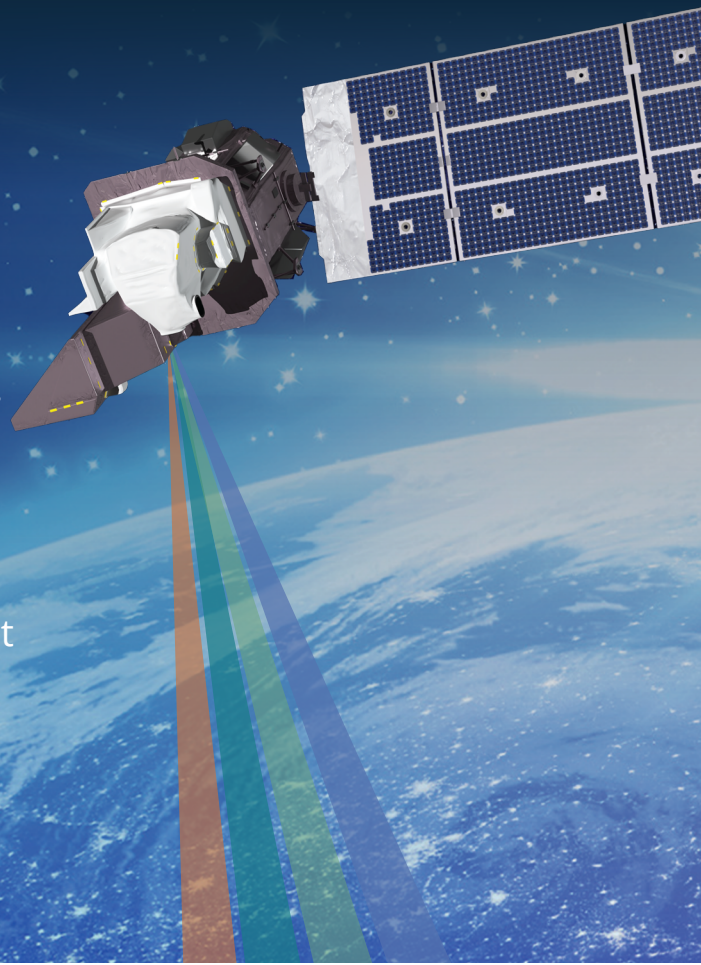


CHALLENGE:

- Climate change impacts are accelerating around the world.
- Disadvantaged and marginalized people are most adversely affected.
- The power of satellite data helps partner countries identify and manage climate risks.

CONNECTING
SPACE TO **VILLAGE**



SERVIR is a partnership of NASA, USAID, and leading geospatial organizations in Asia, Africa, and Latin America.

- We work with countries and organizations in the use of free and open satellite data to build resilience to climate change and address its contributing causes.
- We co-develop innovative solutions through a network of regional hubs to improve sustainable resource management at local, national and regional scales.
- We build capacity to address critical challenges in climate change, food security, water and related disasters, land use, and air quality.

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CONNECTING
SPACE TO **VILLAGE**

Agriculture &
Food Security

Water & Water-
Related Disasters

Land Cover, Land Use
Change & Ecosystems

Weather &
Climate

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SERVIR Focuses on Countries in Asia, Africa, & the Americas

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ClimateSERV Increases Global Access to Critical Hydroclimatic Data

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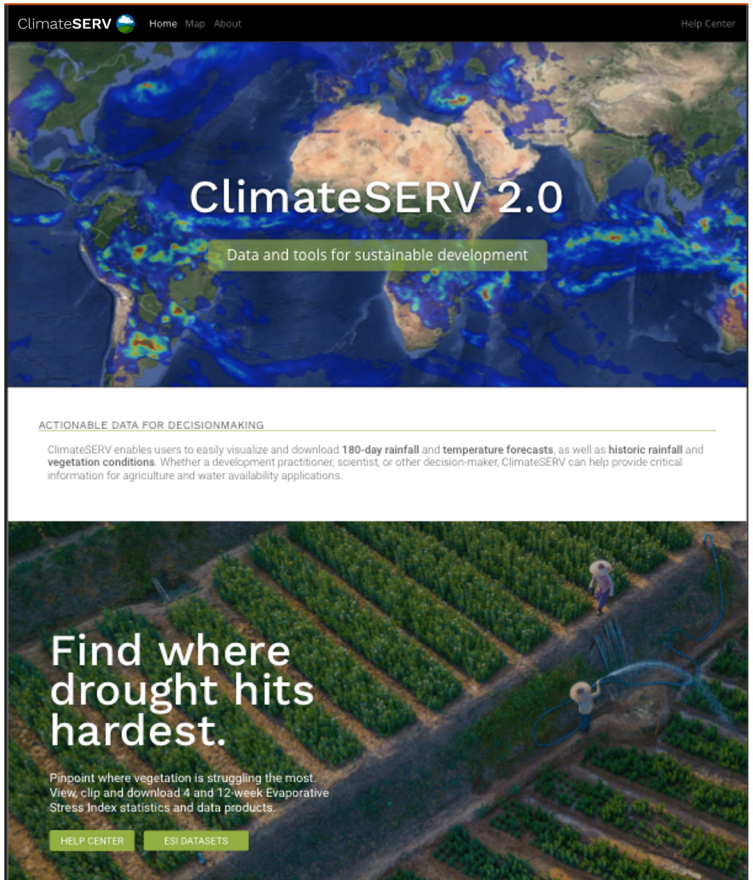
ClimateSERV provides web-accessible, actionable climate information for regional and local decisionmakers:

- Focus on access to high-value datasets used by stakeholders across our SERVIR hubs
- Enables customized subsetting and acquisition of datasets to mitigate bandwidth limitations
- Provides server-side statistical processing of datasets, visualization and download of results
- Custom API developed to support automated data acquisition



ClimateSERV Architecture

Back-End
- Manages and automates storage and access to the data
- Provides API access for user-defined subsetting and delivery of datasets to include:
  - Point/time-series
  - Bounding box
  - Country/Admin features
  - User-defined polygons

API

Front-End
- Supports web app UI
  - Accepts user inputs
  - Visualization and animation of geospatial datasets
  - Visualization and ***server-side*** statistical aggregation:
    - Avg, Min, and Max
    - Time series plots

Web Application (User Interface)

Admin Interface

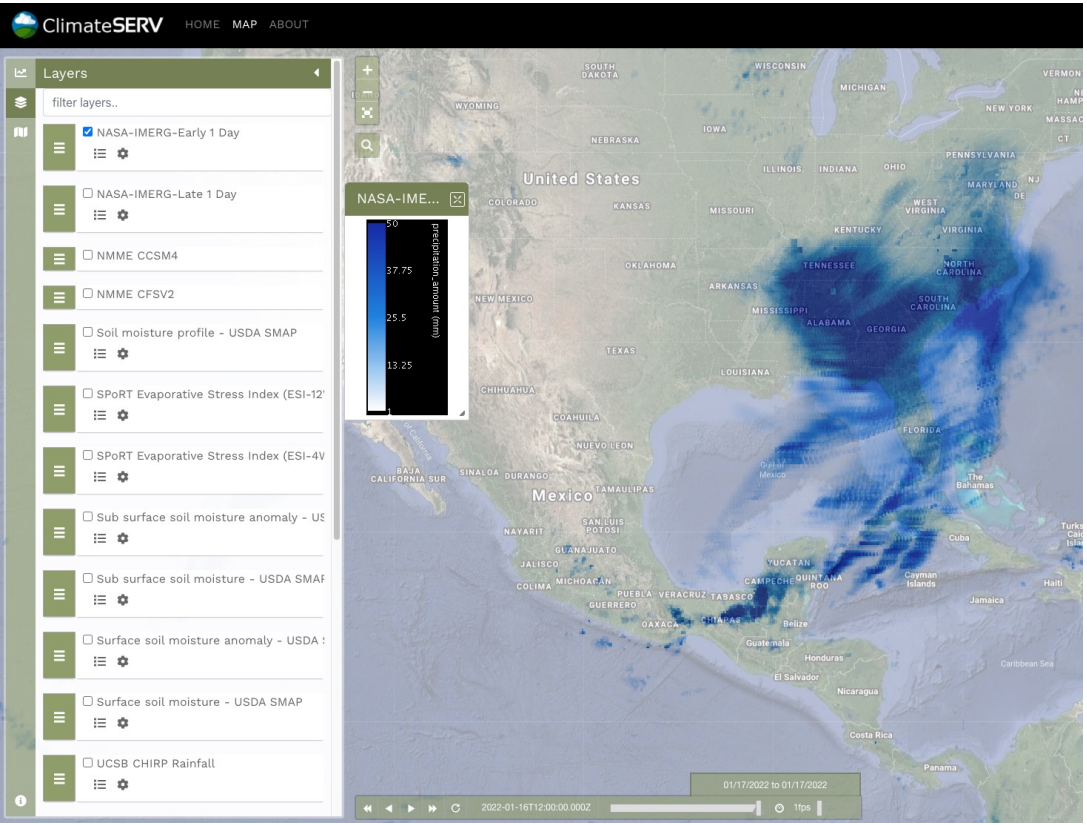
THREDDS Data Server (TDS)
Provides metadata and data access for scientific datasets using ***OPeNDAP, OGC WMS and WCS, HTTP***, and other protocols.

API

Users: Tools

Users: People

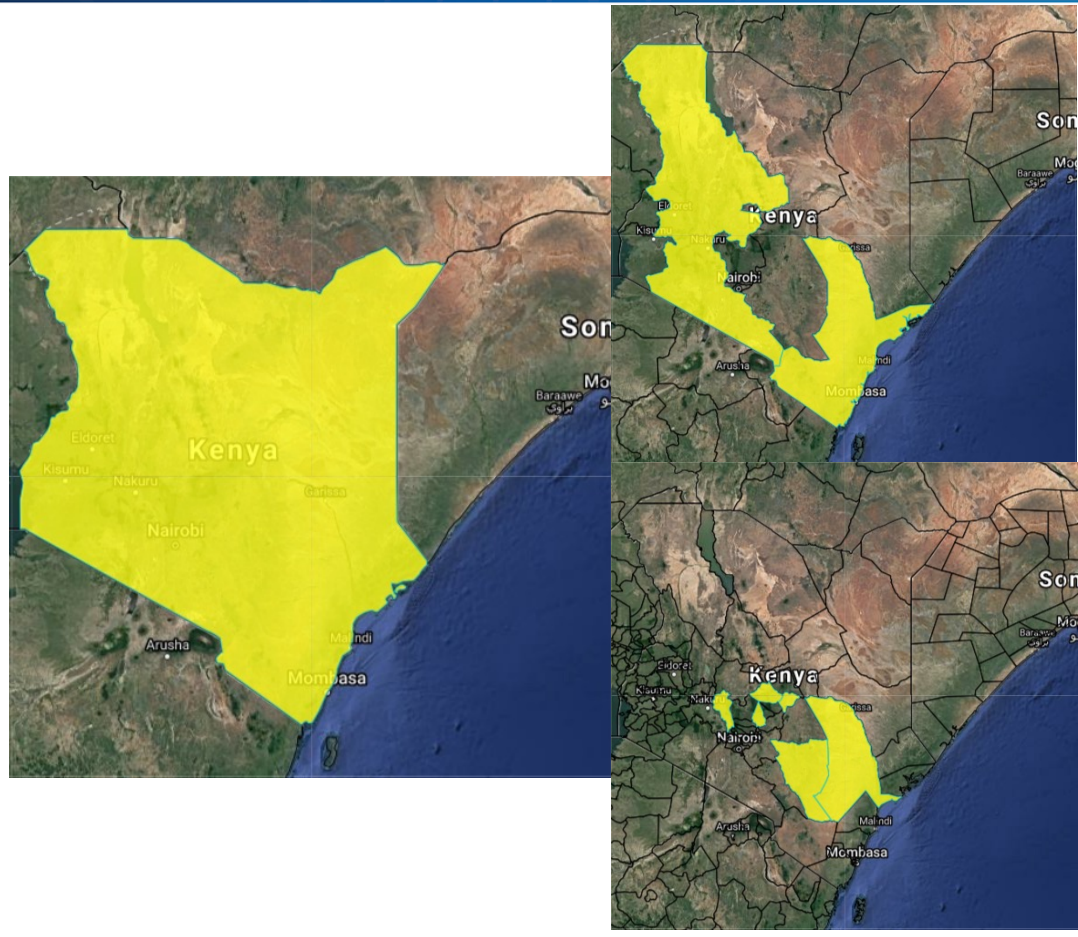
ClimateSERV Datasets



- Datasets in most demand across the network focused on:
  - Precipitation (IMERG, CHIRPS)
  - Surface Moisture (SMAP, ESI)
  - Surface Vegetation (NDVI)
  - Seasonal Forecasts (NMME)
- Both NASA and non-NASA datasets are made available to users
  - We can be flexible about what datasets are hosted to best meet end user needs

ClimateSERV Capabilities

- Temporal subsetting
- Spatial querying
  - Point selection
  - Bounding Box
  - Administrative Boundary
    - Country, Admin 1, Admin 2
  - Custom Polygons
    - GUI or Upload
- Data Download
  - GeoTIFF
  - NetCDF (*coming soon*)
- Generate API call



ClimateSERV Capabilities

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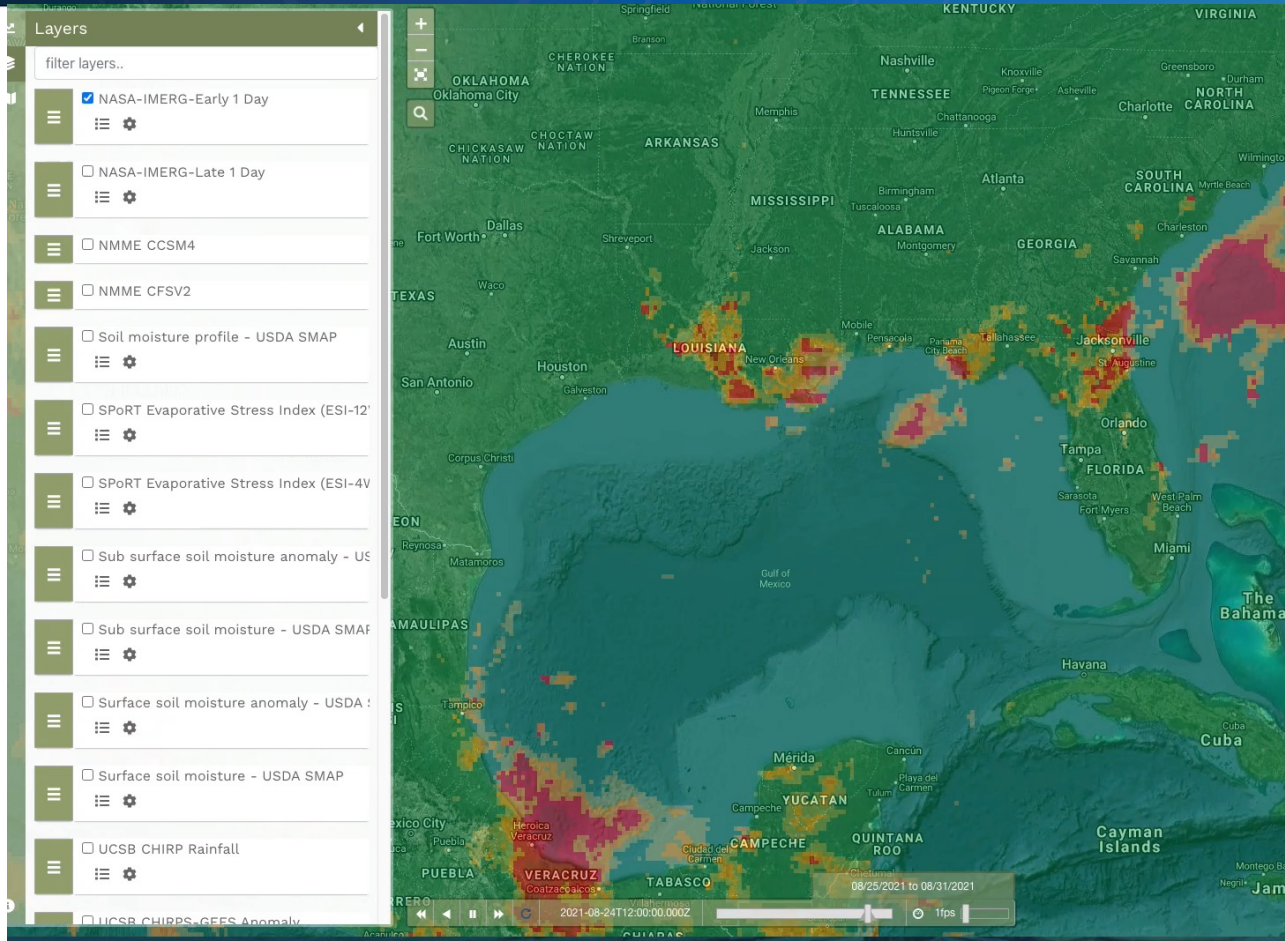
Data Visualization

- Static maps,
  - Layer opacity and color scale configurations
- Animations
  - Temporal range and FPS selection

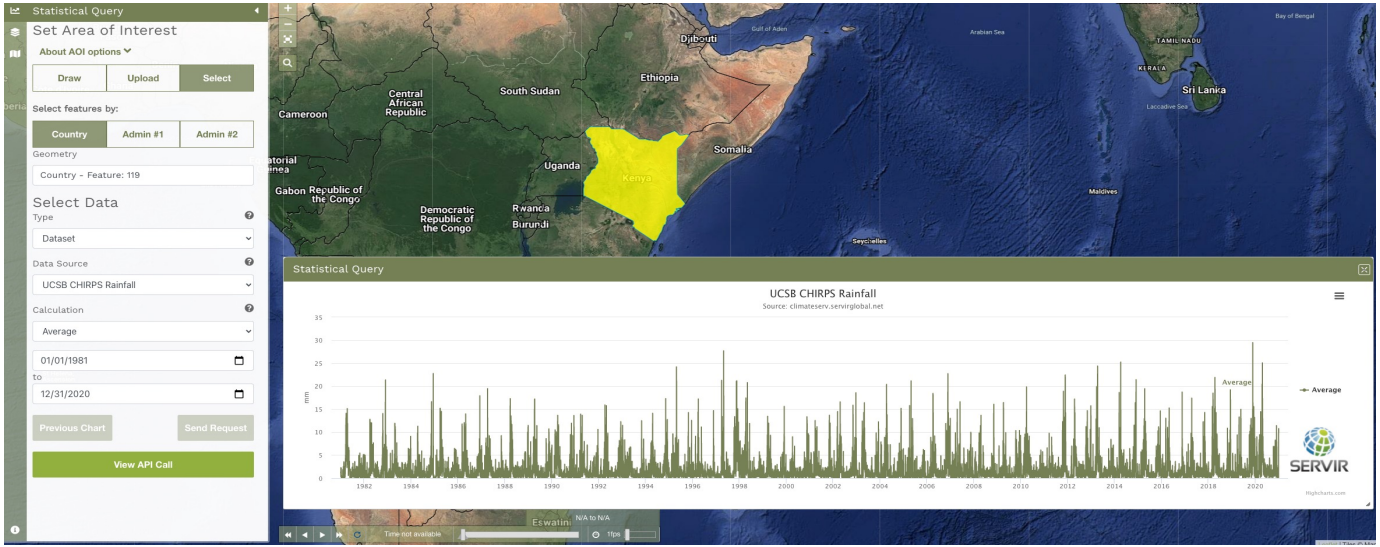
- Goal is to provide a simple interface to view available datasets



ClimateSERV Capabilities

Server-side Statistics

- Polygon masking
- Area-average , Max , Min
- Time-series return with download as CSV, XLS, or JPEG/PNG



Example: 40 year query of CHIRPS rainfall for Kenya area-average; < 30 second return

Summary

- ClimateSERV provides a web-accessible tool to support access to high-value datasets for applications across the global domain, but tailored for SERVIR hubs

Key Points:

- Demand-driven datasets
- Flexible: Download, Visualization, Server-side statistics
- Adaptable: User-specified temporal and spatial querying
- Robust: Low-bandwidth access to data, both GUI and API access

https://climateserv.servirglobal.net/